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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/684,466	10/15/2003	Hyuk Chang	249/248 DIV	4693

27849 7590 05/16/2007

LEE & MORSE, P.C.
3141 FAIRVIEW PARK DRIVE
SUITE 500
FALLS CHURCH, VA 22042

EXAMINER	
MERCADO, JULIAN A	
ART UNIT	**PAPER NUMBER**
1745	

MAIL DATE	DELIVERY MODE
05/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/684,466	CHANG, HYUK	
	Examiner	Art Unit	
	Julian Mercado	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 February 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *17-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *17-30* is/are allowed.

6)☒ Claim(s) *31 and 33-35* is/are rejected.

7)☒ Claim(s) *32* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Remarks

This Office action is responsive to applicant's amendment filed February 22, 2007.

Claims 17-35 are pending, of which claims 31-35 are newly submitted.

Claim Rejections - 35 USC § 102 and 103

The rejection of claims 17, 18 and 20-23 under 35 U.S.C. 102(e) or 35 U.S.C. 103(a) based on applicant's admitted prior art (Wilson , U.S. Pat. 5,234,777) has been withdrawn.

The rejection of claims 17-30 under 35 U.S.C. 102(e) or 35 U.S.C. 103(a) based on Dearnaley et al. (U.S. Pat. 6,153,327) has been withdrawn.

In withdrawing the prior ground of rejection(s), the examiner notes the present amendment to the claims now reciting catalytic metal and carbon particles and the unexpected results as cited by application on pages 17-18 of the specification.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 31 and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Callstrom et al. (U.S. Pat. 5,453,169) in view of Wilson.

For claim 31, Callstrom et al. teaches catalytic metal particles 1.4 to 2.1 nm, and carbon particles between 2.5 and 7.5 nm. See col. 13 lines 31-38 and col. 14 lines 14-26. The carbon/catalytic particles are specifically disclosed as being used to "catalyze an electrochemical reaction in an electrochemical cell (e.g. a fuel cell....)" See col. 2 lines 11-20.

For claim 33, the metal is platinum, *inter alia*. See col. 2 line 22 et seq.

For claims 34 and 35, absent of unexpected results it is asserted that the amount of catalytic material is an optimizable parameter for a result-effective variable, such as the electrochemical potential of the cell. *In re Boesch,* 617 F.2d 272, 205 USPQ 215 (CCPA 1980)

As to a nanophase catalyst layer, it is clear that both the catalytic metal particles and carbon particles are of the nano-dimension, thus, the "phase" of interaction between these particles would naturally flow to be in the nanophase, at least as would be obvious to the skilled artisan. Furthermore, absent of a more explicit recitation of the numerical magnitude of this nanophase layer, the exemplified "2-3 micron thick coating" in Callstron et al. (col. 14 line 18) is considered a nanophase layer insofar as this coating is equivalent to 2000-3000 *nanometers* in thickness.

Callstrom et al. does not explicitly teach the particulars of a fuel cell such as a proton exchange membrane or the electrodes bonded thereto. However, the skilled artisan would find obvious that these structures are requisite parts of *any* fuel cell. See, for example, applicant's admitted prior art, U.S. Pat. 5,234,777 to Wilson, for the detailed reasons of record.

Allowable Subject Matter

Claims 17-30 are allowed.

The following is an examiner's statement of reasons for allowance: the prior art of record does not teach or suggest the instant invention regarding catalytic metal particles and carbon particles forming a nanophase catalyst layer and fabricated by a method comprising coating of a proton exchange polymer membrane by sputtering.

Claim 32 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record does not teach or suggest a catalyst layer having a thickness of 10-100 nm.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian Mercado whose telephone number is (571) 272-1289. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

jam

PATRICK JOSEPH RYAN
SUPERVISORY PATENT EXAMINER